

**BOSTON EDISON COMPANY**  
**CAMBRIDGE ELECTRIC LIGHT COMPANY**  
**COMMONWEALTH ELECTRIC COMPANY**  
**NSTAR GAS COMPANY**

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**Direct Testimony of John J. Spanos**

**Exhibit NSTAR-JJS-1**

**D.T.E. 05-85**

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1

**I. INTRODUCTION**

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**Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

3

A. John J. Spanos, 207 Senate Avenue, Camp Hill, Pennsylvania, 17011.

4

**Q. BY WHOM AND IN WHAT CAPACITY ARE YOU EMPLOYED?**

5

A. Gannett Fleming, Inc. (Gannett Fleming). I am Vice President of the

6

Valuation and Rate Division.

7

**Q. PLEASE DESCRIBE YOUR EDUCATION AND BUSINESS  
EXPERIENCE.**

8

9

A. I have Bachelor of Science degrees in Industrial Management and  
Mathematics from Carnegie-Mellon University and a Master of Business  
Administration from York College of Pennsylvania.

10

11

12

I have been associated with the firm since college graduation in

13

1986. The Valuation and Rate Division of Gannett Fleming provides

14

depreciation consulting services to utility companies in the United States

15

and Canada. As Vice President of Gannett Fleming's Valuation and Rate

16

Division, I am responsible for conducting depreciation, valuation and

17

original cost studies, determining service life and salvage estimates,

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conducting field reviews, presenting recommended depreciation rates to

1 clients, and supporting such rates before state and federal regulatory  
2 agencies.

3 **Q. DO YOU BELONG TO ANY PROFESSIONAL SOCIETIES?**

4 A. Yes. I am a member of the Society of Depreciation Professionals and the  
5 American Gas Association/Edison Electric Institute Industry Accounting  
6 Committee.

7 **Q. DO YOU HOLD ANY SPECIAL CERTIFICATION AS A DEPRECIATION**  
8 **EXPERT?**

9 A. Yes. The Society of Depreciation Professionals has established national  
10 standards for depreciation professionals. The Society administers an  
11 examination to become certified in this field. I passed the certification  
12 exam in September 1997, and was recertified in August 2003.

13 **Q. PLEASE OUTLINE YOUR EXPERIENCE IN THE FIELD OF**  
14 **DEPRECIATION.**

15 A. In June, 1986, I was employed by Gannett Fleming Valuation and Rate  
16 Consultants, Inc. as a Depreciation Analyst. During the period from June,  
17 1986 through December, 1995, I assisted in the preparation of numerous  
18 depreciation and original cost studies for utility companies in various  
19 industries. I helped perform depreciation studies for the following  
20 telephone companies: United Telephone of Pennsylvania, United  
21 Telephone of New Jersey and Anchorage Telephone Utility. I helped

1 perform depreciation studies for the following companies in the railroad  
2 industry: Union Pacific Railroad, Burlington Northern Railroad and  
3 Wisconsin Central Transportation Corporation.

4 I assisted in the preparation of depreciation studies for the following  
5 organizations in the electric industry: Chugach Electric Association, The  
6 Cincinnati Gas & Electric Company (CG&E), The Union Light, Heat and  
7 Power Company (ULH&P), Northwest Territories Power Corporation and  
8 the City of Calgary - Electric System.

9 I assisted in the preparation of depreciation studies for the following  
10 pipeline companies: TransCanada Pipelines Limited, Trans Mountain Pipe  
11 Line Company Ltd., Interprovincial Pipe Line Inc., Nova Gas Transmission  
12 Limited and Lakehead Pipeline Company.

13 I assisted in the preparation of depreciation studies for the following  
14 gas companies: Columbia Gas of Pennsylvania, Columbia Gas of  
15 Maryland, The Peoples Natural Gas Company, T. W. Phillips Gas & Oil  
16 Company, CG&E, ULH&P, Lawrenceburg Gas Company and Penn Fuel  
17 Gas, Inc.

18 I assisted in the preparation of depreciation studies for the following  
19 water companies: Indiana-American Water Company, Consumers  
20 Pennsylvania Water Company and The York Water Company; and

1 depreciation and original cost studies for Philadelphia Suburban Water  
2 Company and Pennsylvania-American Water Company.

3 In each of the above studies, I assembled and analyzed historical  
4 and simulated data, performed field reviews, developed preliminary  
5 estimates of service life and net salvage, calculated annual depreciation,  
6 and prepared reports for submission to state Public Utility Commissions or  
7 federal regulatory agencies. I performed these studies under the general  
8 direction of William M. Stout, P.E.

9 In January, 1996, I was assigned to the position of Supervisor of  
10 Depreciation Studies. In July, 1999, I was promoted to the position of  
11 Manager, Depreciation and Valuation Studies. In December, 2000, I was  
12 promoted to my present position as Vice President of Gannett Fleming  
13 Valuation and Rate Consultants, Inc., now the Valuation and Rate Division  
14 of Gannett Fleming, Inc. I am responsible for conducting depreciation,  
15 valuation and original cost studies, including the preparation of final  
16 exhibits and responses to data requests for submission to the appropriate  
17 regulatory bodies.

18 Since January 1996, I have conducted depreciation studies similar  
19 to those previously listed including assignments for Hampton Water Works  
20 Company, Omaha Public Power District, Enbridge Pipe Line Company,  
21 Inc., Columbia Gas of Virginia, Inc., Virginia Natural Gas Company,

1 National Fuel Gas Distribution Corporation - New York and Pennsylvania  
2 Divisions, The City of Bethlehem - Bureau of Water, The City of  
3 Coatesville Authority, The City of Lancaster - Bureau of Water, Peoples  
4 Energy Corporation, The York Water Company, Public Service Company  
5 of Colorado, Reliant Energy-HLP, Massachusetts-American Water  
6 Company, St. Louis County Water Company, Missouri-American Water  
7 Company, Chugach Electric Association, Alliant Energy, Oklahoma Gas  
8 and Electric Company, Nevada Power Company, Dominion Virginia  
9 Power, NUI-Virginia Gas Companies, PSI Energy, NUI - Elizabethtown  
10 Gas Company, Cinergy Corporation – CG&E, Cinergy Corporation –  
11 ULH&P, Columbia Gas of Kentucky, Idaho Power Company, El Paso  
12 Electric Company, Centennial Pipeline Company, CenterPoint Energy-  
13 Arkansas, CenterPoint Energy – Oklahoma, CenterPoint Energy – Entex,  
14 CenterPoint Energy - Louisiana, NSTAR – Boston Edison Company  
15 (Transmission), South Jersey Gas Company, Bonneville Power  
16 Administration, Enbridge Consumers Gas, Duquesne Light Company, PPL  
17 Gas Services, PPL Electric Utilities Corporation, Westar Energy, Inc.,  
18 Pacific Gas and Electric Company, Sierra Pacific Gas Company, Duke  
19 Energy, SCANA Services, Inc., LaClede Gas Company, EPCOR  
20 Distribution, Inc. and B. C. Gas Utility, Ltd. My additional duties include  
21 determining final life and salvage estimates, conducting field reviews,

1 presenting recommended depreciation rates to management for its  
2 consideration and supporting such rates before regulatory bodies.

3 **Q. HAVE YOU SUBMITTED TESTIMONY TO ANY STATE UTILITY**  
4 **COMMISSIONS ON THE SUBJECT OF UTILITY PLANT**  
5 **DEPRECIATION?**

6 A. Yes. I have submitted testimony to the Pennsylvania Public Utility  
7 Commission, the Commonwealth of Kentucky Public Service Commission,  
8 the Public Utilities Commission of Ohio, the Public Utilities Board of New  
9 Jersey, The Missouri Public Service Commission, the Massachusetts  
10 Department of Telecommunications and Energy (the "Department"), The  
11 Alberta Energy & Utility Board, the Nevada Public Utility Commission, the  
12 Idaho Public Utility Commission, the Louisiana Public Service  
13 Commission, the Oklahoma Corporate Commission, Arkansas Public  
14 Service Commission, State Corporation Commission of the State of  
15 Kansas, The Public Service Commission of South Carolina, Railroad  
16 Commission of Texas – Gas Services Division, the New York Public  
17 Service Commission, Illinois Commerce Commission, and the Indiana  
18 Utility Regulatory Commission.

19 **Q. HAVE YOU RECEIVED ANY ADDITIONAL EDUCATION RELATING TO**  
20 **UTILITY PLANT DEPRECIATION?**

1       A.     Yes. I have completed the following courses conducted by Depreciation  
2             Programs, Inc.: "Techniques of Life Analysis," "Techniques of Salvage and  
3             Depreciation Analysis," "Forecasting Life and Salvage," "Modeling and Life  
4             Analysis Using Simulation" and "Managing a Depreciation Study." I have  
5             also completed the "Introduction to Public Utility Accounting" program  
6             conducted by the American Gas Association.

7       **Q.     WHAT IS THE PURPOSE OF YOUR PREFILED DIRECT TESTIMONY**  
8             **IN THIS PROCEEDING?**

9       A.     My testimony will explain the methods and procedures of the depreciation  
10            reports as well as set forth the annual depreciation rates as of December  
11            31, 2004 for Boston Edison Company ("Boston Edison"), Cambridge  
12            Electric Light Company ("Cambridge") and Commonwealth Electric  
13            Company ("Commonwealth"; together, the electric companies are referred  
14            to as "NSTAR Electric") and NSTAR Gas Company ("NSTAR Gas";  
15            together with NSTAR Electric, the "Companies"). Each exhibit sets forth  
16            detailed methods, procedures and results of the depreciation study as of  
17            December 31, 2004. Each report will be explained in Part II of my  
18            testimony. Each exhibit was prepared and the analyses that underlie each  
19            report were conducted under my direction and supervision.

20       **Q.     PLEASE IDENTIFY THE EXHIBITS THAT YOU ARE SPONSORING.**



1     **A.**     Exhibits NSTAR-JJS-2 and NSTAR-JJS-3 are the depreciation studies for  
2             gas plant in service as of December 31, 2004 and electric plant in service  
3             as of December 31, 2004 respectively. Individual electric company  
4             accrual rates are shown in Exhibit NSTAR-JJS-4 (Cambridge), Exhibit  
5             NSTAR-JJS-5 (Commonwealth) and Exhibit NSTAR-JJS-6 (Boston  
6             Edison).

7     **Q.     WHAT ARE THE PRINCIPAL CONCLUSIONS OF YOUR STUDY AND**  
8     **THE BASES FOR THEM?**

9     **A.**     The principal conclusions of the study are depreciation accrual rates by  
10            account for electric and gas plant for the Companies. Overall, my  
11            recommended annual depreciation accrual rates as of December 31, 2004  
12            for gas plant are set forth on page III-4 of Exhibit NSTAR-JJS-2 and for  
13            electric plant on pages III-4 and III-5 of Exhibit NSTAR-JJS-3. These  
14            depreciation accrual rates were supplied for use in determining its cost of  
15            service for each of the Companies, as presented in the testimony of Mr.  
16            Lubbock and Ms. Vaughan.

17                    The continued separation of depreciation accrual rates by individual  
18                    electric company for NSTAR Electric no longer made sense, since the  
19                    three companies are being managed with the same policies and practices.  
20                    Therefore, the methodology for determining a single depreciation rate per

1 account for the combined electric companies involves consolidation of  
2 three continuing property record systems.

3 Each of the electric company property records systems was  
4 reviewed and totaled by account for the period 1979 through 2004. The  
5 individual electric company records were then consolidated by account in  
6 order to establish one consistent life characteristic by account. The  
7 average service life and survivor curve, along with the consolidated net  
8 salvage percent, original cost and accumulated depreciation by account  
9 were used to establish a depreciation accrual rate.

10 **Q. PLEASE SUMMARIZE THE RESULTS OF THE NSTAR GAS**  
11 **COMPANY DEPRECIATION STUDY.**

12 A. The composite rate for gas plant in service as of December 31, 2004 is  
13 2.52%. This composite rate can be further broken down by function to  
14 produce a distribution plant composite rate of 2.39%, leased appliances  
15 composite rate of 1.89% and general plant composite rate of 3.67%.

16 **Q. PLEASE SUMMARIZE THE RESULTS OF THE NSTAR ELECTRIC**  
17 **COMPANY DEPRECIATION STUDY.**

18 A. The composite rate for electric plant in service as of December 31, 2004 is  
19 3.29%. This composite rate can be further broken down by function to

1 produce a transmission plant composite rate of 2.35%, distribution plant  
2 composite rate of 3.18% and general plant composite rate of 7.17%.

3 **II. METHODS USED IN DEPRECIATION STUDY**

4 **Q. PLEASE DEFINE THE CONCEPT OF DEPRECIATION.**

5 A. Depreciation refers to the loss in service value not restored by current  
6 maintenance, incurred in connection with the consumption or prospective  
7 retirement of utility plant in the course of service from causes that can be  
8 reasonably anticipated or contemplated, against which the company is not  
9 protected by insurance. Among the causes to be given consideration are  
10 wear and tear, decay, action of the elements, inadequacy, obsolescence,  
11 changes in the art, changes in demand and the requirements of public  
12 authorities.

13 **Q. IN PREPARING THE DEPRECIATION STUDIES, DID YOU FOLLOW**  
14 **GENERALLY ACCEPTED PRACTICES IN THE FIELD OF**  
15 **DEPRECIATION AND VALUATION?**

16 A Yes.

17 **Q. PLEASE DESCRIBE THE CONTENTS OF YOUR REPORTS.**

18 A. My reports are presented in three parts. Part I, Introduction, presents the  
19 scope and basis for each depreciation study. Part II, Methods Used in the  
20 Estimation of Depreciation, includes descriptions of the basis of the study,  
21 the estimation of survivor curves and net salvage and the calculation of

1 annual and accrued depreciation. Part III, Results of Study, presents a  
2 description of the results, summaries of the depreciation calculations,  
3 graphs and tables that relate to the service life and net salvage analyses,  
4 and the detailed depreciation calculations.

5 The tables on page III-4 of Exhibit NSTAR-JJS-2 and III-4 and III-5  
6 of Exhibit NSTAR-JJS-3 present the estimated survivor curve, the net  
7 salvage percent, the original cost as of December 31, 2004, the book  
8 reserve and the calculated annual depreciation accrual and rate for each  
9 account or subaccount. The section beginning on page III-5 of Exhibit  
10 NSTAR-JJS-2 and page III-6 of Exhibit NSTAR-JJS-3 presents the results  
11 of the retirement rate analyses prepared as the historical bases for the  
12 service life estimates. The section beginning on page III-41 of Exhibit  
13 NSTAR-JJS-2 and page III-87 of Exhibit NSTAR-JJS-3 presents the  
14 results of the salvage analysis. The section beginning on page III-52 of  
15 Exhibit NSTAR-JJS-2 and page III-105 of Exhibit NSTAR-JJS-3 presents  
16 the depreciation calculations related to surviving original cost as of  
17 December 31, 2004.

18 **Q. PLEASE IDENTIFY THE DEPRECIATION METHOD THAT YOU USED.**

19 A. I used the straight line remaining life method of depreciation, with the  
20 average service life procedure. This method of depreciation aims to  
21 distribute the unrecovered cost of fixed capital assets over the estimated

1 remaining useful life of each unit or group of assets in a systematic and  
2 rational manner.

3 **Q. DID YOU PERFORM A SEPARATE DEPRECIATION STUDY FOR**  
4 **EACH OF THE THREE ELECTRIC DISTRIBUTION COMPANIES?**

5 A. The depreciation accruals for each of the three NSTAR Electric  
6 companies were developed separately. The detailed calculation by  
7 account and vintage for each company as well as a summary schedule is  
8 attached to this testimony (Exhibit NSTAR-JJS-4, Exhibit NSTAR-JJS-5  
9 and Exhibit NSTAR-JJS-6). The survivor curve and net salvage percents  
10 were determined at the company-wide level and applied to the individual  
11 company plant balances. This approach was included in the testimony to  
12 allow for comparability to past studies and allow the opportunity for  
13 individual revenue requirements, if desired.

14 **Q. HOW DID YOU DETERMINE THE RECOMMENDED ANNUAL**  
15 **DEPRECIATION ACCRUAL RATES?**

16 A. I did this in two phases. In the first phase, I estimated the service life and  
17 net salvage characteristics for each depreciable group, that is, each plant  
18 account or subaccount identified as having similar characteristics. In the  
19 second phase, I calculated the composite remaining lives and annual  
20 depreciation accrual rates based on the service life and net salvage  
21 estimates determined in the first phase.

1       **Q.     PLEASE DESCRIBE THE FIRST PHASE OF THE DEPRECIATION**  
2               **STUDY, IN WHICH YOU ESTIMATED THE SERVICE LIFE AND NET**  
3               **SALVAGE CHARACTERISTICS FOR EACH DEPRECIABLE GROUP.**

4       A.     The service life and net salvage study consisted of compiling historical  
5               data from records related to the Companies' plant; analyzing these data  
6               to obtain historic trends of survivor and net salvage characteristics;  
7               obtaining supplementary information from management, and operating  
8               personnel concerning practices and plans as they relate to plant  
9               operations; and interpreting the above data and the estimates used by  
10              other electric and gas utilities to form judgments of average service life  
11              and net salvage characteristics.

12       **Q.     WHAT HISTORICAL DATA DID YOU ANALYZE FOR THE PURPOSE**  
13               **OF ESTIMATING SERVICE LIFE CHARACTERISTICS?**

14       A.     I analyzed the Companies' accounting entries that record plant  
15               transactions during the 26-year period 1979 through 2004 for electric plant  
16               and 24-year period 1981 through 2004 for gas plant. The transactions  
17               included additions, retirements, transfers and the related balances. The  
18               Companies' records also included surviving dollar value by year installed  
19               for each plant account as of December 31, 2004.

20       **Q.     WHAT METHOD DID YOU USE TO ANALYZE THIS SERVICE LIFE**  
21               **DATA?**

1       A.     I used the retirement rate method for all accounts. This is the most  
2             appropriate method when aged retirement data are available, because this  
3             method determines the average rates of retirement actually experienced  
4             by the Company during the period covered by the study.

5       **Q.     WOULD YOU EXPLAIN HOW YOU USED THE RETIREMENT RATE**  
6             **METHOD TO ANALYZE THE COMPANIES' SERVICE LIFE DATA?**

7       A.     I applied the retirement rate method to each different group of property in  
8             the study. For each property group, I used the retirement rate method to  
9             form a life table which, when plotted, shows an original survivor curve for  
10            that property group. Each original survivor curve represents the average  
11            survivor pattern experienced by the several vintage groups during the  
12            experience band studied. The survivor patterns do not necessarily  
13            describe the life characteristics of the property group; therefore,  
14            interpretation of the original survivor curves is required in order to use  
15            them as valid considerations in estimating service life. The Iowa-type  
16            survivor curves were used to perform these interpretations.

17       **Q.     WHAT IS AN "IOWA-TYPE SURVIVOR CURVE" AND HOW DID YOU**  
18             **USE SUCH CURVES TO ESTIMATE THE SERVICE LIFE**  
19             **CHARACTERISTICS FOR EACH PROPERTY GROUP?**

20       A.     Iowa-type curves are a widely used group of generalized survivor curves  
21             that contain the range of survivor characteristics usually experienced by

1 utilities and other industrial companies. The Iowa curves were developed  
2 at the Iowa State College Engineering Experiment Station through an  
3 extensive process of observing and classifying the ages at which various  
4 types of property used by utilities and other industrial companies had been  
5 retired.

6 Iowa-type curves are used to smooth and extrapolate original  
7 survivor curves determined by the retirement rate method. The Iowa  
8 curves and truncated Iowa curves were used in this study to describe the  
9 forecasted rates of retirement based on the observed rates of retirement  
10 and the outlook for future retirements. As I will explain, the use of  
11 truncated curves is appropriate to reflect retirements of plant components  
12 that may not be fully depreciated at the time a plant is retired.

13 The estimated survivor curve designations for each depreciable  
14 property group indicate the average service life, the family within the Iowa  
15 system to which the property group belongs, and the relative height of the  
16 mode. For example, the Iowa 44-R1 indicates an average service life of  
17 forty-four years; a right-moded, or R-type curve (the mode occurs after  
18 average life for right-moded curves); and a low height, 1, for the mode  
19 (possible modes for R-type curves range from 1 to 5).



1       **Q.    WHAT APPROACH DID YOU USE TO ESTIMATE THE LIVES OF**  
2       **SIGNIFICANT FACILITIES SUCH AS OFFICE BUILDINGS AND**  
3       **SERVICE CENTERS?**

4       A.    I used the life span technique to estimate the lives of significant facilities  
5       for which concurrent retirement of the entire facility is anticipated. In this  
6       technique, the survivor characteristics of such facilities are described by  
7       the use of interim survivor curves and estimated probable retirement  
8       dates.

9               The interim survivor curves describe the rate of retirement related  
10       to the replacement of elements of the facility, such as, for a building, the  
11       retirements of plumbing, heating, doors, windows, roofs, etc., that occur  
12       during the life of the facility. The probable retirement date provides the  
13       rate of final retirement for each year of installation for the facility by  
14       truncating the interim survivor curve for each installation year at its  
15       attained age at the date of probable retirement. The use of interim  
16       survivor curves truncated at the date of probable retirement provides a  
17       consistent method for estimating the lives of the several years of  
18       installation for a particular facility inasmuch as a single concurrent  
19       retirement for all years of installation will occur when it is retired.

20       **Q.    HAS GANNETT FLEMING USED THIS APPROACH IN OTHER**  
21       **PROCEEDINGS?**

1       A.     Yes, we have used the life span technique in performing depreciation  
2             studies presented to and accepted by many public utility commissions  
3             across the United States and Canada.

4       **Q.     WHAT ARE THE BASES FOR THE PROBABLE RETIREMENT YEARS**  
5             **THAT YOU HAVE ESTIMATED FOR EACH FACILITY?**

6       A.     The bases for the probable retirement years are life spans for each facility  
7             that are based on judgment and incorporate consideration of the age, use,  
8             size, nature of construction, management outlook and typical life spans  
9             experienced and used by other electric and gas utilities for similar  
10            structures. Most of the life spans result in probable retirement years that  
11            are many years in the future. As a result, the retirements of these facilities  
12            are not yet subject to specific management plans. Such plans would be  
13            premature. At the appropriate time, detailed studies of the economics of  
14            rehabilitation and continued use or retirement of the structure will be  
15            performed and the results incorporated in the estimation of the facility's life  
16            span.

17       **Q.     DID YOU PHYSICALLY OBSERVE THE COMPANIES' PLANT AND**  
18             **EQUIPMENT AS PART OF YOUR DEPRECIATION STUDY?**

19       A.     Yes. I made field reviews of NSTAR Electric's property in January 2003  
20             and August 2005 and NSTAR Gas' property in January 2003 and August  
21             2005 to observe representative portions of plant. Field reviews are

1 conducted to become familiar with the Companies' operations and obtain  
2 an understanding of the function of the plant and information with respect  
3 to the reasons for past retirements and the expected future causes of  
4 retirements. This knowledge as well as information from other discussions  
5 with management was incorporated in the interpretation and extrapolation  
6 of the statistical analyses.

7 **Q. HOW DID YOUR EXPERIENCE IN DEVELOPMENT OF OTHER**  
8 **DEPRECIATION STUDIES AFFECT YOUR WORK IN THIS CASE?**

9 A. Because I customarily conduct field reviews for my depreciation studies, I  
10 have had the opportunity to visit scores of similar plants and meet with  
11 operations personnel at other companies. The knowledge accumulated  
12 from those visits and meetings provide me useful information that I can  
13 draw on to confirm or challenge my numerical analyses concerning plant  
14 condition and remaining life estimates.

15 **Q. WOULD YOU PLEASE EXPLAIN THE CONCEPT OF "NET**  
16 **SALVAGE"?**

17 A. Net salvage is a component of the service value of capital assets that is  
18 recovered through depreciation rates. The service value of an asset is its  
19 original cost less its net salvage. Net salvage is the salvage value  
20 received for the asset upon retirement less the cost to retire the asset.

1 When the cost to retire exceeds the salvage value, the result is negative  
2 net salvage.

3 Inasmuch as depreciation expense is the loss in service value of an  
4 asset during a defined period, e.g. one year, it must include a ratable  
5 portion of both the original cost and the net salvage. That is, the net  
6 salvage related to an asset must be incorporated in the cost of service  
7 during the same period as its original cost so that customers receiving  
8 service from the asset pay rates that include a portion of both elements of  
9 the asset's service value, the original cost and the net salvage value.

10 For example, the full recovery of the service value of a \$1000  
11 electric pole will include not only the \$1000 of original cost, but also, on  
12 average, \$650 to remove the pole at the end of its life and \$50 in salvage  
13 value. In this example, the net salvage component is negative \$600 (\$50 -  
14 \$650), and the net salvage percent is negative 60%  $((\$50 - \$650)/\$1000)$ .

15 **Q. PLEASE DESCRIBE HOW YOU ESTIMATED NET SALVAGE**  
16 **PERCENTAGES.**

17 A. I estimated the net salvage percentages for most accounts by  
18 incorporating analyses of the historical data for the period 1992 through  
19 2004, by considering estimates for other electric and gas companies, and  
20 by exercising my expert judgment. In the historical analyses for most  
21 accounts, the net salvage, cost of removal and gross salvage amounts

1           were expressed as percents of the original cost retired. These percents  
2           were calculated on annual and three-year moving average bases for the  
3           1992 to 2004 period.

4           **Q. PLEASE DESCRIBE THE SECOND PHASE OF THE PROCESS THAT**  
5           **YOU USED IN THE DEPRECIATION STUDY IN WHICH YOU**  
6           **CALCULATED COMPOSITE REMAINING LIVES AND ANNUAL**  
7           **DEPRECIATION ACCRUAL RATES.**

8           A. After I estimated the service life and net salvage characteristics for each  
9           depreciable property group, I calculated the annual depreciation accrual  
10          rates for each group based on the straight line remaining life method,  
11          using remaining lives weighted consistent with the average service life  
12          procedure. The annual depreciation accrual rates were developed as of  
13          December 31, 2004.

14          **Q. PLEASE DESCRIBE THE STRAIGHT LINE REMAINING LIFE METHOD**  
15          **OF DEPRECIATION.**

16          A. The straight line remaining life method of depreciation allocates the  
17          original cost of the property, less accumulated depreciation, less future net  
18          salvage, in equal amounts to each year of remaining service life.

19          **Q. PLEASE DESCRIBE THE AVERAGE SERVICE LIFE PROCEDURE**  
20          **FOR CALCULATING REMAINING LIFE ACCRUAL RATES.**

1       A.    The average service life procedure defines the group for which the  
2            remaining life annual accrual is determined. Under this procedure, the  
3            annual accrual rate is determined for the entire group or account based on  
4            its average remaining life and this rate is applied to the surviving balance  
5            of the group's cost. The average remaining life of the group is calculated  
6            by first dividing the future book accruals (original cost less allocated book  
7            reserve less future net salvage) by the average remaining life for each  
8            vintage. The average remaining life for each vintage is derived from the  
9            area under the survivor curve between the attained age of the vintage and  
10           the maximum age. Then, the sum of the future book accruals is divided  
11           by the sum of the annual accruals to determine the average remaining life  
12           of the entire group for use in calculating the annual depreciation accrual  
13           rate.

14       **Q.    PLEASE DESCRIBE AMORTIZATION ACCOUNTING.**

15       A.    Amortization accounting is used for accounts with a large number of units,  
16            but small asset values. In amortization accounting, units of property are  
17            capitalized in the same manner as they are in depreciation accounting.  
18            However, depreciation accounting is difficult for these assets because  
19            periodic inventories are required to properly reflect plant in service.  
20            Consequently, retirements are recorded when a vintage is fully amortized  
21            rather than as the units are removed from service. That is, there is no

1 dispersion of retirement. All units are retired when the age of the vintage  
2 reaches the amortization period. Each plant account or group of assets is  
3 assigned a fixed period which represents an anticipated life during which  
4 the asset will render service. For example, in amortization accounting,  
5 assets that have a 15-year amortization period will be fully recovered after  
6 15 years of service and taken off the Company books, but not necessarily  
7 removed from service. In contrast, assets that are taken out of service  
8 before 15 years remain on the books until the amortization period for that  
9 vintage has expired.

10 **Q. FOR WHICH PLANT ACCOUNTS IS AMORTIZATION ACCOUNTING**  
11 **IMPLEMENTED?**

12 A. Amortization accounting is appropriate only for certain General Plant  
13 accounts. These accounts are General Accounts 391.1, 391.2, 393.0,  
14 394.0, 395.0, 397.0, and 398.0, which represent approximately one  
15 percent of depreciable plant for electric plant and approximately one  
16 percent of depreciable plant for gas plant.

17 **Q. PLEASE USE AN EXAMPLE TO ILLUSTRATE THE DEVELOPMENT**  
18 **OF THE ANNUAL DEPRECIATION ACCRUAL RATE FOR A**  
19 **PARTICULAR GROUP OF PROPERTY IN YOUR DEPRECIATION**  
20 **STUDIES.**

1       A.    I will use Account 367, Underground Conductors and Devices, as an  
2            example because it is one of the largest depreciable groups and  
3            represents 23% of depreciable plant for NSTAR Electric's plant.

4            The retirement rate method was used to analyze the survivor  
5            characteristics of this property group. Aged plant accounting data were  
6            compiled from 1979 through 2004 and analyzed for periods that best  
7            represent the overall service life of this property. The life table for the  
8            1979-2004 experience band is presented on pages III-54  
9            through III-56 of Exhibit NSTAR-JJS-3. The life table displays the  
10           retirement and surviving ratios of the aged plant data exposed to  
11           retirement by age interval. For example, page III-54 shows \$4,648,899  
12           retired during age interval 0.5-1.5 with \$833,012,924 exposed to  
13           retirement at the beginning of the interval. Consequently, the retirement  
14           ratio is 0.0056 ( $\$4,648,899 / \$833,012,924$ ) and the surviving ratio is  
15           0.9944 ( $1 - 0.0056$ ). The percent surviving at age 0.5 of .9944 percent is  
16           multiplied by the survivor ratio of 99.89 to derive the percent surviving at  
17           age 1.5 of 99.33 percent. This process continues for the remaining age  
18           intervals for which plant was exposed to retirement during the period  
19           1979-2004. The resultant life table, or original survivor curve, is plotted  
20           along with the estimated smooth survivor curve, the 44-R1 on page III-53.



1           The net salvage percent is presented on page III-98 of Exhibit  
2           NSTAR-JJS-3. The percentage is based on the result of annual gross  
3           salvage minus the cost to remove plant assets as compared to the original  
4           cost of plant retired during the period 1992 through 2004. The 13-year  
5           period experienced negative \$5,667,657 (\$683,991 – \$6,351,648) in net  
6           salvage for \$7,656,030 plant retired. The result is negative net salvage of  
7           74 percent ( $-\$5,667,657 / \$7,656,030$ ), however, the most recent five-year  
8           period and the rolling three-year averages trend toward forty-five percent.  
9           Therefore, negative 45 percent was recommended.

10           My calculation of the annual depreciation related to original cost of  
11           Account 367, Underground Conductor and Devices, at December 31,  
12           2004, is presented on pages III-135 through III-137 Exhibit NSTAR-JJS-3.  
13           The calculation is based on the 44-R1 survivor curve, 45% negative net  
14           salvage, the attained age, and the allocated book reserve. The tabulation  
15           sets forth the installation year, the original cost, calculated accrued  
16           depreciation, allocated book reserve, future accruals, remaining life and  
17           annual accrual. These totals are brought forward to the table on page III-  
18           4.

19       **Q.    DOES THIS CONCLUDE YOUR TESTIMONY?**

20       A.    Yes, it does.